Bank of Canada
Monthly Research Update

August 2019

This monthly newsletter features the latest research publications by Bank of Canada economists. The report includes papers appearing in external publications and staff working papers published on the Bank of Canada's website.

PUBLISHED PAPERS

In-Press

Arifovic, Jasmina & Hommes, Cars & Salle, Isabelle, "Learning to believe in simple equilibria in a complex OLG economy - evidence from the lab", Journal of Economic Theory, Vol 183: 106-182, September 2019

Forthcoming

Ho, Anson T.Y. & Huynh, Kim P. & Jacho-Chavez, David T., "Productivity and Reallocation: Evidence from Ecuadorian Firm-Level Data", Economía Journal, The Latin American and Caribbean Economic Association - LACEA

Halaburda, Hanna & Jullien, Bruno & Yehezkel, Yaron, "Dynamic Competition with Network Externalities: How History Matters", RAND Journal of Economics

Zhao, Guihai, "Ambiguity, Nominal Bond Yields and Real Bond Yields", American Economic Review: Insights

Ichihashi, Shota, "Online Privacy and Information Disclosure by Consumers", American Economic Review

Dunbar, Geoffrey & Lewbel, Arthur & Pendakur, Krishna, "Identification of Random Resource Shares in Collective Households Without Preference Similarity Restrictions", Journal of Business & Economic Statistics

Priftis, Romanos & Theofilakou, Anastasia, "Growth Effects of Corporate Balance Sheet Adjustments in the EU", Empirical Economics

STAFF WORKING PAPERS

Damar, H. Evren & Gropp, Reint & Mordel, Adi, "Flight from Safety: How a Change to the Deposit Insurance Limit Affects Households' Portfolio Allocation", Bank of Canada Staff Working Paper 2019-29

Allen, Jason & Clark, Robert & Hickman, Brent & Richert, Eric, "Resolving Failed Banks: Uncertainty, Multiple Bidding & Auction Design", Bank of Canada Staff Working Paper 2019-30

Emenogu, Ugochi & Michelis, Leo, "Financial Frictions, Durable Goods and Monetary Policy", Bank of Canada Staff Working Paper 2019-31

Huynh, Kim & Nicholls, Gradon & Shcherbakov, Oleksandr, "Explaining the Interplay Between Merchant Acceptance and Consumer Adoption in Two-Sided Markets for Payment Methods", Bank of Canada Staff Working Paper 2019-32

STAFF DISCUSSION PAPERS

Cunningham, Rose & Rai, Vikram & Hess, Kristina, "Exploring Wage Phillips Curves in Advanced Economies", Bank of Canada Staff Discussion Paper 2019-8

ABSTRACTS

Learning to believe in simple equilibria in a complex OLG economy - evidence from the lab

We set up a laboratory experiment to empirically investigate equilibrium selection in a complex economic environment. We use the overlapping-generation model of Grandmont (1985), which displays multiple perfect-foresight equilibria, including periodic and chaotic dynamics. The equilibrium selection problem is not solved under learning, as each outcome is predicted by at least one existing learning theory. We find that subjects in the lab systematically coordinate on an equilibrium despite the complexity of the environment. Coordination only happens on simple equilibria, in this case the steady state or the period-two cycle, a result which is predicted only if the subjects follow simple learning rules. This suggests that relevant perfect-foresight equilibria should be robust to the use of simple rules.

Productivity and Reallocation: Evidence from Ecuadorian Firm-Level Data

Ecuador, a developing small open economy, serves as an important case study for aggregate productivity growth and inputs reallocation. Since little is known about the economic performance of Ecuador with its crisis and reforms between 1998 and 2007, this paper utilizes a comprehensive micro data set from Ecuador's National Institute of Statistics and Censuses (Instituto Nacional de Estadística y Censos) to study Ecuadorian firm dynamics in that period. It is found that reallocation of factor inputs (2.6 percent) and technical efficiency growth (3.2 percent) on the intensive margin are the dominant sources of aggregate productivity growth. Net entry, as a channel of reallocation on the extensive margin, generally has minor effects (-0.1 percent) and only contributes to productivity growth in later recovery period (2002-2004).

Dynamic Competition with Network Externalities: How History Matters

We consider dynamic competition among platforms in a market with network externalities. A platform that dominated the market in the previous period becomes "focal" in the current period, in that agents play the equilibrium in which they adopt the focal platform whenever such equilibrium exists. Yet when faced with higher-quality

competition, can a low-quality platform remain focal? In the finite-horizon case, the unique equilibrium is efficient for "patient" platforms; with an infinite time horizon, however, there are multiple equilibria where either the low- or high-quality platform dominates. If qualities are stochastic, the platform with a better average quality wins with a higher probability, even when its realized quality is lower, and this probability increases as platforms become more patient. Hence social welfare may decline as platforms become more forward looking.

Ambiguity, Nominal Bond Yields and Real Bond Yields

Equilibrium bond-pricing models rely on inflation being bad news for future growth to generate upward-sloping nominal yield curves. We develop a model that can generate upward-sloping nominal and real yield curves by instead using ambiguity about inflation and growth. Ambiguity can help resolve the puzzling fact that upward-sloping yield curves have persisted despite positive inflation shocks changing from negative to positive news about growth in the last twenty years. Investors make decisions using worst-case beliefs, under which the expectations hypothesis roughly holds. However, inflation and growth evolve over time under the true distribution, and this difference makes excess returns on long-term bonds predictable. The model is also consistent with the recent empirical findings on the term structure of equity returns.

Online Privacy and Information Disclosure by Consumers

I study the welfare and price implications of consumer privacy. A consumer discloses information to a multi-product seller, which learns about the consumer's preferences, sets prices, and makes product recommendations. While the consumer benefits from accurate product recommendations, the seller may use the information to price discriminate. I show that the seller prefers to commit to not using consumer information for pricing to encourage information disclosure. However, this commitment hurts the consumer, who could be better off by pre-committing to withhold some information. In contrast to single-product models, total surplus may be lower if the seller can base prices on information.

Identification of Random Resource Shares in Collective Households Without Preference Similarity Restrictions

Resource shares, defined as the fraction of total household spending going to each person in a household, are important for assessing individual material well-being, inequality and poverty. They are

difficult to identify because consumption is measured typically at the household level, and many goods are jointly consumed, so that individual-level consumption in multi-person households is not directly observed. We consider random resource shares, which vary across observationally identical households. We provide theorems that identify the distribution of random resource shares across households, including children's shares. We also provide a new method of identifying the level of fixed or random resource shares that does not require previously needed preference similarity restrictions or marriage market assumptions. Our results can be applied to data with or without price variation. We apply our results to households in Malawi, estimating the distributions of child and female poverty across households.

Growth Effects of Corporate Balance Sheet Adjustments in the EU

This paper investigates the impact of active balance sheet adjustments in the non-financial corporate sector on economic growth in the EU. We first jointly model firms' ability to reduce their balance sheet imbalances and a growth equation in an instrumental variables (IV) panel context. This enables us to explicitly consider the contemporaneous interaction between corporate balance sheet adjustment and growth, which can otherwise bias inference. Our main findings inter alia suggest that: i) periods of active corporate deleveraging are associated on average with lower output growth compared to periods when no adjustment takes place, and ii) a decline in corporate debt overhang supports output growth. To explore the deleveraging mechanism qualitatively we then employ a banking variant of the Commission's QUEST model and show that following a deleveraging shock, triggered by a tightening of firms' collateral constraints, the effects on investment and GDP are negative in the short-run. In the medium run once corporate debt has been reduced the effects fade away allowing the economy to recover. In the long run the effects are largely neutral suggesting that the source of investment financing, be it financial intermediaries or the stock market, does not seem to matter.

Flight from Safety: How a Change to the Deposit Insurance Limit Affects Households' Portfolio Allocation

Deposit insurance protects depositors from failing banks, thus making insured deposits risk-free. When a deposit insurance limit is increased, some deposits that previously were uninsured become

insured, thereby increasing the share of risk-free assets in households' portfolios. This increase cannot simply be undone by households, because to invest in uninsured deposits, a household must first invest in insured deposits up to the limit. This basic insight is the starting point of the analysis in this paper.

We show that in a standard portfolio allocation model, faced with a deposit insurance limit increase, households move some of their assets out of deposits into risky alternatives, such as mutual funds. Our empirical analysis, taking advantage of a deposit insurance increase in Canada in 2005 and detailed household portfolio data, confirms the insights from the model and stands up to multiple alternative explanations. Hence, we show that an increase in the deposit insurance limit results in a sizable deposit outflow.

Our work has important policy lessons. First, although there is considerable evidence on the financial stability consequences of deposit insurance (as it reduces the impact of runs in a crisis), we document a novel implication where enhanced protection may also trigger deposit outflows during non-crisis times. Second, the paper highlights the link between deposit insurance and the composition of household portfolios. It emphasizes the role that uninsured deposits play in the household investment decision and the importance of studying them separately from insured deposits when analyzing portfolio allocation choice.

Resolving Failed Banks: Uncertainty, Multiple Bidding & Auction Design

Bank resolution is costly. In the United States, the Federal Deposit Insurance Corporation (FDIC) typically resolves failing banks by auction. If a bank is failing, healthy banks are encouraged to compete at auction to buy it. This results in a cash transfer from the FDIC to the buyer; the failing bank then continues under new ownership.

The FDIC tries to minimize these transfers by holding competitive auctions. The main feature of these auctions is that they are scoring auctions.

First, healthy banks place bids that can differ along multiple dimensions. These are scored based on their estimated costs.

Second, to foster competition, bidders are encouraged to submit multiple bids, even though only one bid can win.

This paper proposes a methodology for analyzing auction environments where bids are ranked according to multiple attributes but there is uncertainty about the scoring rule used to evaluate them. We use this framework to estimate the cost to the FDIC of having an opaque scoring rule. We find that the FDIC could reduce costs of resolution by around 17 percent by removing uncertainty.

Financial Frictions, Durable Goods and Monetary Policy

Financial frictions affect how much consumers spend on durable and non-durable goods. Borrowers can face both loan-to-value (LTV) constraints and payment-to-income (PTI) constraints. In this setting, a monetary contraction drastically reduces the amount consumers can borrow to purchase durable goods. We examine these effects in a dynamic stochastic general equilibrium (DSGE) model.

DSGE models with durables predict that when monetary policy tightens, non-durable consumption will fall and durable consumption will rise. But this prediction contradicts empirical evidence, which shows that both types of consumption fall, and durables fall more than non-durables. Studies have tried to resolve this puzzle by integrating LTV constraints into the model, but without much success. In our model, we use a broader set of financial frictions that includes PTI limits on borrowing.

We show that using both LTV and PTI constraints in the model solves the counterfactual increase in durables following a contractionary monetary shock and delivers the correct correlation. Including the PTI limit in the model leads to a decrease in labour supply. This reduces output, which, in turn, makes it more likely that total durable expenditures will fall.

Explaining the Interplay Between Merchant Acceptance and Consumer Adoption in Two-Sided Markets for Payment Methods

Recent consumer and merchant surveys show a decrease in the use of cash at point-of-sale (POS). Increasingly, consumers and merchants have access to a growing array of payment innovations as substitutes for cash. The market for payments is two-sided, meaning that a method of payment can be used only if both consumers and merchants adopt/accept it. This paper develops a model to assess how innovations affect consumers' adoption and merchants' acceptance of various payment instruments, and their usage patterns at the POS.

We model this interdependence in two stages. First, consumers and merchants decide on which methods of payment to adopt and accept, respectively. Second, consumers and merchants meet at the POS, and the consumer chooses their preferred method of payment given what the merchant accepts. Estimates from our model suggest that both sides of the market can benefit from accepting all means of payment. Further, our model predicts that merchants are much more sensitive to an increase in their payment costs than consumers.

We use our model to predict what would happen under three scenarios. First, increasing merchants' cost of using credit cards would significantly reduce merchant acceptance of this payment instrument in favour of debit. Second, the cost of using cash would have to increase substantially on both sides of the market for cash usage to fall below 1 percent of transaction volume. Finally, even if all consumers/merchants adopted/accepted all methods of payment, cash would fall but would remain at 20 percent of transaction volume. These findings suggest a completely cashless society is unlikely in the foreseeable future.

Exploring Wage Phillips Curves in Advanced Economies

We investigate the extent to which excess supply (demand) in labour markets contributes to a lower (higher) growth rate of average nominal wages for workers. Using panel methods on data from 10 advanced economies for 1992–2018, we produce reduced-form estimates of a wage Phillips curve specification that is consistent with a New Keynesian framework. We find comparable effects on nominal wage growth from several indicators of "slack" in the labour market: unemployment rates, unemployment rate gaps, the prime-age employment-to-population ratios, a composite labour market indicator constructed using a principal component for a wide range of labour force data, and unemployment rates separated by duration of unemployment. Our results provide evidence that while the slope of the wage Phillips curve seems to have become flatter following the global financial crisis in 2008, the relationship still appears to be highly significant. We find that the long-term unemployment rate (unemployment longer than six months) has had a larger effect on wage growth in the period since 2008. We also investigate the shape of the Phillips curve and find some evidence of a convex relationship between labour market slack and nominal wage growth, particularly for the pre-crisis period. Piecewise regressions suggest some mixed evidence on nominal rigidities in the aggregate data.

UPCOMING EVENTS

Charles Martineau (University of Toronto, Rotman School of
    Management)
Organizer: Rodrigo Sekkel (FMD)
Date: 5 September 2019

Marc Giannoni (Federal Reserve Bank of Dallas)
Organizer: José Dorich (CEA)
Date: 6 September 2019

Ben Lester (Federal Reserve Bank of Philadelphia)
Organizer: Jean-Sébastien Fontaine (FMD)
Date: 12 September 2019

David Berger (Northwestern University, Department of Economics)
Organizer: Anthony Landry (CEA)
Date: 13 September 2019

Lucian (Luke) Taylor (University of Pennsylvania, Wharton Business
    School)
Organizer: Jon Witmer (FMD)
Date: 26 September 2019

Giorgio Primiceri (Northwestern University, Department of
    Economics)
Organizer: Joel Wagner (CEA)
Date: 27 September 2019

Julia Thomas (Ohio State University, Department of Economics)
Organizer: Yuko Imura (INT)
Date: 1 October 2019

Domenico Giannone (Federal Reserve Bank of New York)
Organizer: Rodrigo Sekkel (FMD)
Date: 2 October 2019

Michael Koetter (Halle Institute for Economic Research)
Organizer: Radoslav Raykov (FSD)
Date: 3 October 2019

Patrick Augustin (McGill University, Desautels Faculty of
Management)
Organizer: Corey Garriott (FMD)
Date: 10 October 2019

Ufuk Akcigit (University of Chicago, Department of Economics)
Organizer: Ben Tomlin (CEA)
Date: 11 October 2019

James Cloyne (University of California Davis, Department of
Economics)
Organizer: Nuno Marques da Paixao (FSD)
Date: 15 October 2019

Robert Marquez (University of California Davis, Graduate School of
Management)
Organizer: Thibaut Duprey (FSD)
Date: 24 October 2019

Virgiliu Midrigan (New York University, Department of Economics)
Organizer: Katsiaryna Kartashova (CEA)
Date: 25 October 2019

Haelim Anderson (Federal Deposit Insurance Corporation)
Organizer: Jason Allen (FMD)
Date: 31 October 2019

Morten Ravn (University College London, Department of Economics)
Organizer: Martin Kuncl (CEA)
Date: 15 November 2019

Catherine Tucker (Massachusetts Institute of Technology, Sloan
School of Management)
Organizer: Shota Ichihashi (CEA)
Date: 19 November 2019

Sacha Gelfer (Bently University, Department of Economics)
Organizer: Lin Shao (INT)
Date: 13 December 2019

Todd Clark (Federal Reserve Bank of Cleveland)
Organizer: Luis Uzeda (CEA)
Date: 3 April 2020